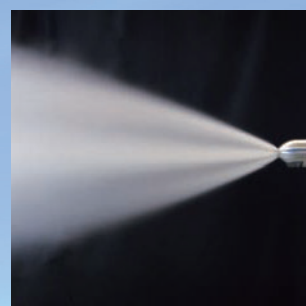
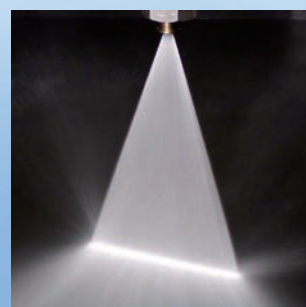




“The Fog Engineers”
H. IKEUCHI & CO., LTD.

LINEUP OF IKEUCHI'S SPRAY NOZZLES



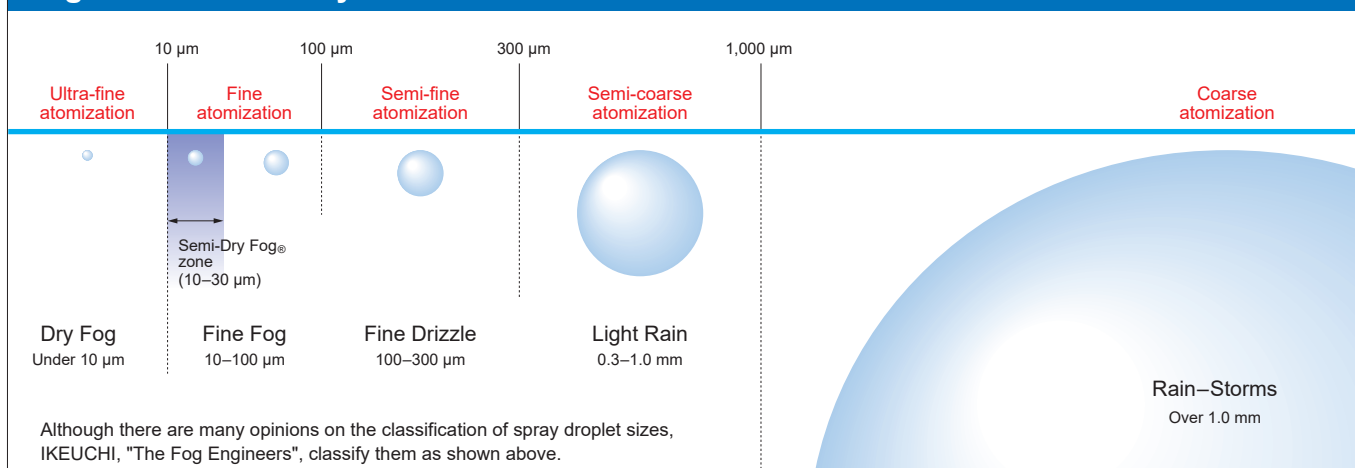
IKEUCHI, "The Fog Engineers"

Based on accumulated advanced technology and know-how as the Fog Engineers, IKEUCHI continues to pursue methods to generate and utilize fog to meet the ever diversifying and sophisticated needs of its customers, and to contribute to the development of a greater industrial world.

Spray Nozzle Precision Guarantee

All IKEUCHI's precision-made hydraulic spray nozzles (except for air nozzles) are guaranteed for spray angle and spray capacity. Each pneumatic spray nozzle series also has spray capacity inspection standard, and only the nozzles that pass the inspection will be shipped.

Fog Classification System



Variety of Spray Nozzles

Hydraulic Spray Nozzles

Produce atomization using liquid pressure

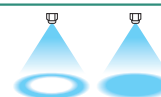
Flat Spray Nozzles

Provide a flat fan spray pattern with mountain-shaped or even distribution. Ideal for (high-pressure) cleaning and spraying.



Cone Spray Nozzles

Provide a hollow cone or full cone spray pattern (or square spray pattern). Suitable for gas cleaning, steel plate cooling, humidifying, etc.



Solid Stream Jet Nozzles

Solid stream spray with highest spray impact. Ideal for powerful cleaning.



Special Purpose Nozzles

Include slit laminar nozzles, air nozzles, ejector nozzles, and more.



Pneumatic Spray Nozzles

Produce atomization using air and liquid pressures

Fine Fog Spray Nozzles

Widely used pneumatic nozzles for gas cooling, moisture control, precision cleaning, etc. Mean droplet diameter: 20–100 μm (fine atomization)

Semi-Fine, Semi-Coarse Fog Spray Nozzles

Ideal for precision cooling in the steel industry, and for precision cleaning in the electronics industry. Mean droplet diameter: 100 μm or more (semi-fine to semi-coarse atomization)

Clog-resistant Spray Nozzles

Designed specially for spraying viscous liquid.

Blower-Air Driven, Ultra-Low Pressure Spray Nozzles

Utilize blower air instead of compressed air for atomizing to save installation and running cost.






Steam-Driven Spray Nozzles

Innovative pneumatic nozzles using steam instead of compressed air for atomizing.


HYDRAULIC SPRAY NOZZLES—FLAT SPRAY

[Symbol key] ● : Features ■ : Main applications


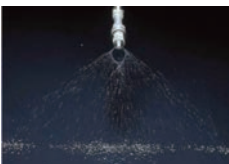

Standard Flat Spray Nozzles

| | | | | |
|--|---|---|---|---|
|  [Spray pattern] |  3-piece structure V/VV series | <ul style="list-style-type: none"> ● Flat spray pattern with a mountain-shaped distribution. Tapered edges overlap to provide uniform spray distribution in multi-nozzle arrangements. |  Coin-shaped CVVP series | <ul style="list-style-type: none"> ● So thin that nozzle alignment in tight spaces is easy. ■ Cleaning and cooling. |
| |  One-piece structure VP/VVP series | <ul style="list-style-type: none"> ■ Cleaning, spraying, cooling, etc. For polishing, available in UPE material (UVVP series). |  Quick detachable INVV series | <ul style="list-style-type: none"> ● Easy installation and removal without tools saves maintenance time. ■ Applications that require accurate nozzle positioning. Etching, cleaning, etc. |



Even Flat Spray Nozzles

| | | | | |
|---|--|---|--|--|
|  [Spray pattern] |  3-piece structure VE series | <ul style="list-style-type: none"> ● Flat spray pattern with uniform distribution across the pattern area. Even spray impact across the entire spray area. |  High-pressure cleaning VNP series | <ul style="list-style-type: none"> ● Flat spray with uniform distribution. ■ High pressure cleaning (for cars, containers, tanks). |
| |  One-piece structure VEP series | <ul style="list-style-type: none"> ■ Cleaning, cooling and spraying. |  Descaling nozzles DSP series | <ul style="list-style-type: none"> ● Powerful cleaning and descaling nozzle with a thin flat spray like a razor blade. |
|  [Spray distribution] | | |  Descaling nozzles TDSS series | <ul style="list-style-type: none"> ● Water saving & high impact descaling nozzle for steel industries. Longer lasting design, uniform spray impact. |


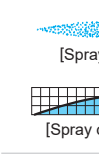


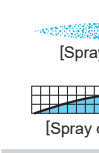





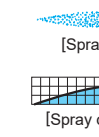
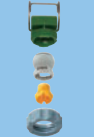
Wide-angle Flat Spray Nozzles

| | | |
|---|--|---|
|  |  Wide-angle spray YYP series | <ul style="list-style-type: none"> ● Wide-angle flat spray nozzle to use at low pressure. Minimal clogging among our flat spray nozzles with the same flow rate. ■ Cleaning, foam breaking, water screen applications. |
|  |  Wide-angle, ultra-low pressure LYYP series | <ul style="list-style-type: none"> ● Wide-angle flat spray nozzle to use at ultra-low pressure of 0.015 MPa. Low spray impact creating a bubble-free spray surface. ■ Spraying developing solution in semi-conductor manufacturing processes. |

Off-center Even Flat Spray Nozzles

| | | |
|--|---|---|
|  |  Off-center spray OVVEP series | <ul style="list-style-type: none"> ● The diagonal spray of the OVVEP series prevents accumulation of spray fluid in a multiple nozzle arrangement. No need for oblique installation, as the angle is built-in. ■ Steel plate cooling, water rinsing after acid washing. |
|--|---|---|

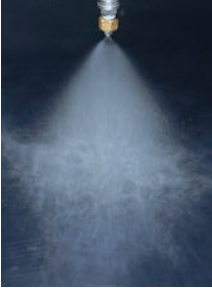








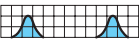



Special Flat Spray Nozzles

| | | | |
|--|--|--|---|
|  Purging |  [Spray pattern] [Spray distribution] |  Self-cleaning MOMoJet® series | <ul style="list-style-type: none"> ● Nozzle tip purges foreign particles by reducing the liquid pressure. The straight-through orifice makes this nozzle suitable for multi-nozzle set-up. ■ Cleaning with circulated water, cooling, foam breaking, and cleaning wire and felt parts of paper making machines. For solid stream spray, MOMoJet® C series is available. |
|  |  [Spray pattern] [Spray distribution] |  Universal-jointed UT+VP series | <ul style="list-style-type: none"> ● Includes an integrated universal ball joint to adjust the spray direction. Spray direction is adjustable over a range of 40 degrees as desired. ■ Cleaning, spraying, etc. For solid stream spray, UT+CP series is available. |
|  ← Water is sprayed to show spray pattern. |  [Spray pattern] |  Air & steam spraying VZ series | <ul style="list-style-type: none"> ● Produces a flat spray pattern of air or steam. Air flow volume can be adjusted by changing the nozzle tip. ■ Cleaning, dust suppression, drying, air curtain, humidification, moisture control, etc. |
|  |  [Spray pattern] [Spray distribution] |  Quick installation QB series | <ul style="list-style-type: none"> ● Easy to install. Just drill a hole into the pipe and insert the nozzle. Spray direction is adjustable within 50 degrees as desired. Quick-detachable design helps to reduce maintenance time significantly. ■ Pre-treatment for painting, water cleaning, etc. |


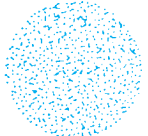





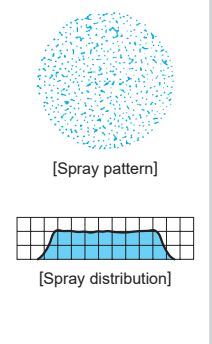
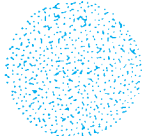





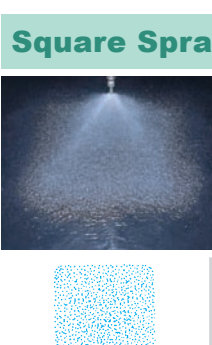



HYDRAULIC SPRAY NOZZLES—CONE SPRAY

[Symbol key] ● : Features ■ : Main applications



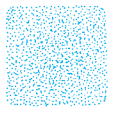
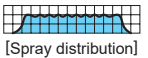
Hollow Cone Spray Nozzles

| | | | | | |
|--|---|---|--|---|--|
|  |  [Spray pattern]  [Spray distribution] |  Fine fog, ultra-low flow rate KB series | <ul style="list-style-type: none"> ● Finest atomization among our hydraulic nozzles. Ceramic parts provide highly wear resistance. ■ Humidifying, cooling, etc. |  Fine fog, ultra-low flow rate KBN series | <ul style="list-style-type: none"> ● Finest atomization among our hydraulic nozzles. Plastic nozzle with alumina-ceramic orifice. ■ Cooling, humidifying, dust suppression. |
| | |  Semi-fine fog, low flow rate K series | <ul style="list-style-type: none"> ● Ceramic orifice and closer provide excellent wear resistance. ■ Humidifying, cooling, spraying, etc. |  Semi-fine fog, low flow rate KKBP series | <ul style="list-style-type: none"> ● Large free passage diameter minimizes clogging. Easy maintenance with detachable whirler. ■ Humidifying, cooling, snow making, etc. |
|  |  [Spray pattern]  [Spray distribution] |  Low flow rate KD series | <ul style="list-style-type: none"> ● Combines compact design and semi-fine atomization capability. Ceramic parts provide highly wear resistance. ■ Cooling, spraying, etc. |  Alumina ceramic AP-AL92 series | <ul style="list-style-type: none"> ● Highly wear-resistant alumina ceramic nozzle with a stainless steel socket. ■ Cooling, cleaning, etc. |
| | |  Medium capacity AAP series | <ul style="list-style-type: none"> ● Stable spray pattern at both low and high pressure. No whirler design minimizes clogging. ■ Cleaning, cooling, etc. |  Large capacity TAA series | <ul style="list-style-type: none"> ● Stable spray pattern even at low pressure. Made of high wear-resistant silicon carbide. Lightweight. ■ Spraying in absorber of gas desulfurization equipment, slurry spraying, etc. |



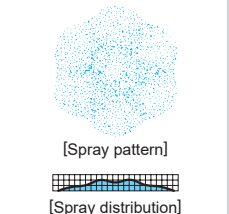

Full Cone Spray Nozzles

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|--|--|--|--|--|---|
|  |  [Spray pattern]  [Spray distribution] |  Low flow rate J series | <ul style="list-style-type: none"> ● Lowest flow rate among our full cone spray nozzles. Ceramic parts provide highly wear resistance. ■ Spraying, cleaning, cooling, etc. |  Quick detachable INJJX(-Y) series | <ul style="list-style-type: none"> ● Easy installation and removal without tools saves maintenance time. ■ Etching, cleaning, etc. |
| | |  Standard type JJXP series | <ul style="list-style-type: none"> ● Spray capacity ranges from small to medium. X-shaped whirler provides a large free passage, minimizing clogging. Made of stainless steel or PVDF. ■ Cleaning, cooling, spraying, etc. |  Low flow rate JJRP series | <ul style="list-style-type: none"> ● Plastic nozzle with a disc whirler, providing uniform distribution even at low flow rate. Available in PTFE or PVDF. ■ Pure water cleaning, spraying, etc. |
|  |  [Spray pattern]  [Spray distribution] |  Ceramic orifice & whirler JUP series | <ul style="list-style-type: none"> ● Ceramic disc whirler and ceramic orifice provide excellent wear resistance. ■ Cleaning, cooling, spraying, etc. |  Narrow-angle spray NJJP series | <ul style="list-style-type: none"> ● No whirler, minimal clogging. Unique design to produce narrow-angle full cone spray pattern. ■ Cleaning, cooling, etc. |
| | |  Alumina ceramic JUXP-AL92 series | <ul style="list-style-type: none"> ● High wear-resistant alumina ceramic nozzle with a stainless steel socket. ■ Spraying in absorber of gas desulfurization equipment, slurry spraying, etc. |  Clog-resistant AJP series | <ul style="list-style-type: none"> ● No-whirler design with a large free passage diameter minimizes clogging. Available in stainless steel, PPS, or alumina ceramic. ■ Cleaning, cooling, applications where clogging is a concern. |
|  |  [Spray pattern]  [Spray distribution] |  Large capacity TJJX series | <ul style="list-style-type: none"> ● Large spray capacity. Flanged connection. ■ Cooling, reacting, spraying, etc. |  Wide-angle spray BBXP series | <ul style="list-style-type: none"> ● The 120° spray angle provides a larger spray coverage. ■ Cleaning, cooling, fire extinguishing, etc. |

Square Spray Nozzles

| | |
|---|---|
|  |  Square spray SSXP series |
|  [Spray pattern]  [Spray distribution] | <ul style="list-style-type: none"> ● Square full cone spray pattern with uniform distribution leaves no gaps in multi-nozzle arrangement. Wide spray angle of 90–100° provides large spray coverage. ■ Cleaning, cooling, spraying. |




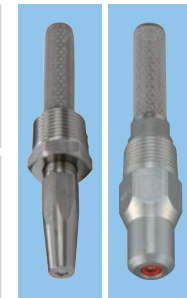
Special Full Cone Spray Nozzles

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|  |  Seven-head, fine fog 7KB series | <ul style="list-style-type: none"> ● Seven KB hollow cone spray nozzles installed on a compact adaptor header produce large volume of fine atomization. ■ Flue gas cooling/cleaning, moisture control, humidification. |
|  |  Seven-head, all metal 7JJXP series | <ul style="list-style-type: none"> ● Seven JJXP full cone spray nozzles with a compact adaptor. Mean spray droplet diameter is about half the size of other single-head full cone spray nozzles with the same spray capacity. ■ Flue gas cooling/cleaning, dust suppression, etc. |

HYDRAULIC SPRAY NOZZLES—SOLID STREAM SPRAY

[Symbol key] ● : Features ■ : Main applications

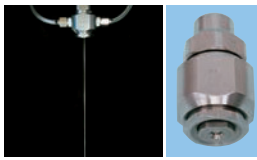


Solid Stream Spray Nozzles

| | | | | |
|--|--|---|--|---|
|  <p>[Spray pattern]</p> <p>[Spray distribution]</p> |  <p>Standard type CP/CCP series</p>  <p>Convex round inlet CRP/CCRP series</p> | <ul style="list-style-type: none"> ● Highest impact solid stream. Much larger flow of solid stream jet as compared with other solid stream nozzles having the same orifice diameters. ■ High pressure cleaning. ● Designed for minimal clogging. The convex round inlet prevents floating particles from flowing into the nozzle, thereby reducing clogging. ■ Cleaning in paper & pulp making process. |  <p>Trimming nozzles CM/CTM series CMP-T series</p> | <ul style="list-style-type: none"> ● Extra fine solid stream with high impact cutting force. Wear-resistant nozzle orifice made of ceramic, alumina ceramic, or tungsten carbide. ■ Paper trimming, cleaning of precision machine parts, food cutting, etc. |
|--|--|---|--|---|

Multi-orifice Solid Stream Spray Nozzles

| | | |
|--|--|---|
|  <p>[Spray pattern]</p> <p>[Spray distribution]</p> |  <p>Multi-orifice solid stream 2CP/2CCP series 7CP/7CCP series</p> | <ul style="list-style-type: none"> ● Multiple solid streams with high impact force. 2-orifice and 7-orifice nozzles are available. Compact design. ■ Bottle washing, cleaning dandy rolls and returnable containers, etc. |
|--|--|---|


Special Solid Stream Spray Nozzles

| | | |
|--|---|---|
|  <p>ON/OFF spray control SO-CM series</p> <ul style="list-style-type: none"> ● Spray ON/OFF can be regulated by turning the pilot air ON/OFF. Anti-drip design. ■ Trimming, cutting, marking, etc. <p>For flat spray, SO-V series is available.</p> |  <p>Pipe cleaning RSP series</p> <ul style="list-style-type: none"> ● Cleans the inside of pipes and tubes, moving by spraying high-impact solid stream jets in different directions as driving force. ■ Cleaning inside pipes/drains/tubes, removing scale and rust. |  <p>Rotating pipe cleaning RSP-R series</p> |
|--|---|---|

SPECIAL PURPOSE NOZZLES/RELATED PRODUCTS

Air Nozzles

TAIFUJet® series



- Takes in surrounding air, boosting the volume of powerful air flow.


Special Purpose Nozzles

Slit laminar nozzles



- Slit nozzles with thin laminar flow of water or air. Water is sprayed in the above to better show the spray pattern.

SPILLBACK nozzles



- Spray capacity is variable without changing spray pressure. Available in a variety of types.

Tank cleaning nozzles







- Compact rotating nozzle. Rotates by cleaning liquid force only. Ideal for tank and container cleaning.

Ejector nozzles



- **EJX** series spouts out 3–4 times the supplied amount. Ideal for solution agitation.

Related Products Applying Spray Nozzles / Accessories

| | | | |
|--|---|--|--|
| <p>Spray header BRASIKan® series</p>  <ul style="list-style-type: none"> ● Rotated by the handwheel, the brushes inside the header pipe clear the clog. | <p>ARS Filter</p>  <ul style="list-style-type: none"> ● Auto reverse self-cleaning by powerful jet spraying. Water saving and minimal maintenance. | <p>Mist fan COOLJetter®</p>  <ul style="list-style-type: none"> ● Combined unit of a fan and nozzles that delivers Semi-Dry Fog® over a broad area using fan wind. | <p>Universal joints</p>  <p>UT WUT</p> <p>Photo of adaptor with a spray nozzle</p> <ul style="list-style-type: none"> ● Universal joint adaptors to adjust spray direction. |
|--|---|--|--|

PNEUMATIC SPRAY NOZZLES

[Symbol key] ● : Features ■ : Main applications

Fine Fog Spray Nozzles



Photo of BIM series

Low flow rate
BIM series
CBIM series
SCBIM series

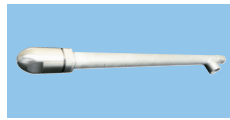
- Fine atomization with mean droplet diameters of 20–100 μm . Unique, minimal-clogging design. Available in flat fan spray, full cone spray, or hollow cone spray pattern.

- Spraying, cooling, moisture control, washing, etc.



Dry fog humidifier AKIMist® "E"

- Compact, high efficiency humidifier that produces a large volume of Dry Fog (non-wetting fog). Energy-saving design.



Large capacity
GSIM II series

- Large spray capacity, low air-water ratio. Simple structure, easy maintenance.
- Flue gas cooling in waste incineration facilities.



Medium capacity
AKIJet® series

- Atomized droplets are impinged against each other at optimum condition, resulting in uniform distribution of droplet size.
- Moisture control, combustion, cooling.

Semi-Fine, Semi-Coarse Fog Spray Nozzles



High impact, flat spray
VVEA series

- Thin and sharp spray pattern with high impact. Stable spray angle over large turn-down ratio.
- Precision cleaning.



Slit nozzles
PSN series

- Pneumatic slit nozzles providing uniform spray in the total width. Achieve higher spray impact by installing closer to the object.
- Glass substrate cleaning, etc.



Flat spray
DOVEA series

- Secondary cooling nozzles developed to satisfy crucial requirements for spray nozzles in continuous casting processes in steel making. Minimal variation in spray angle, spray distribution and droplet size over a large turn-down ratio. A large free passage diameter. DOVEA series for even flat spray pattern, DDA series for thick even flat spray pattern, and JJA series for full cone spray pattern.



Thick flat spray
DDA series



Full cone spray
JJA series

- Gas cooling, steel plate cooling, waste water combustion.

Clog-resistant Spray Nozzles

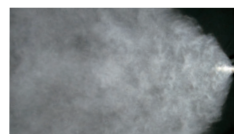


Full cone spray SETOJet series
Flat spray SETOV series

- Pneumatic spray nozzle specially designed for spraying viscous liquid. Clog-resistant design. External mixing type that air and liquid are mixed outside nozzle for atomization.
- Spraying viscous liquid (oil, lubricant, etc.) or slurry. Solenoid-activated type (SETO-SD series) is also available.



Photo of SETOJet series

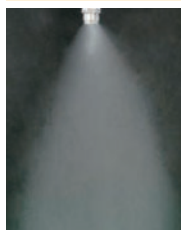


Wide-angle flat spray YYA series

- Combines "clog-resistant" and "wide spray angle" features. Capable of spraying viscous liquid up to approx. 300 cP. Compact design.
- Spraying viscous liquid (oil, honey, etc.)



Blower-Air Driven, Ultra-Low Pressure Spray Nozzles



Fine fog, flat spray BAVV series

- Flat spray pattern, fine atomization with mean droplet diameter of 40 μm or more. Energy-saving for blower-use. Low running cost. Large free passage diameter.
- Steel plate cooling, cleaning, etc.

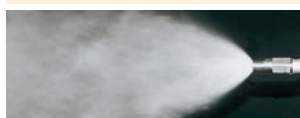


Semi-fine fog LSIM series

- Semi-fine atomization by applying blower air pressure. Saves on installation and running cost due to utilizing blower air for atomizing.
- Gas cooling, etc.



Steam-Driven Spray Nozzles



Steam-driven
JOKIJet® series

- Atomization by steam instead of compressor air. Drastic saving on running cost.
- Gas cooling, moisture control.

SPRAY NOZZLE SYSTEMS

Cooling System

Cooling system **COOLJetter® Dome**



- Cooling system with COOLJetter®, providing effective and low-cost cooling for large spaces.

Industrial cooling system



- Industrial cooling solution for solid and gas.

LYOHM System for outdoor cooling



- Energy-saving, outdoor cooling system using Semi-Dry Fog® reduces temperatures with evaporative cooling without wetting passersby.

Humidification System

Hydraulic humidification system **AirULM®**



- Humidifies large spaces at low running cost. Air compressor is not required.

Office humidification system **AU-KIT**



- Humidification system for an office and other large indoor spaces, easy to use with tap water and a power source.

Industrial humidification system **AirAKI®**



- The world's first humidification system that guarantees the target humidity using the highest quality Dry Fog.

Fog Landscape System (Creating Artificial Sea of Clouds)

- Fog system that uses special nozzles developed for creating artificial sea of clouds for landscape purposes.





“The Fog Engineers”
H. IKEUCHI & CO., LTD.



ISO9001: 2015 certified
(H. IKEUCHI & CO., LTD., Japan only)



Headquarters

Daiichi kyogyo Bldg., 1-15-15, Awaza, Nishi-ku, Osaka 550-0011, Japan

Tel: 81-6-6538-4015 Fax: 81-6-6538-4022

Email: overseas@kirinoikeuchi.co.jp

URL: <https://www.kirinoikeuchi.co.jp/eng/>

Overseas network

IKEUCHI USA, INC.

4722 Ritter Avenue, Blue Ash, OH 45242, USA

Tel: 1-513-942-3060 Fax: 1-513-942-3064

info@ikeuchi.us

<https://www.ikeuchi.us/>

PT. IKEUCHI INDONESIA

Ruko Rodeo Drive, Jl. Hollywood Boulevard Blok B6 No. 18 & 19,
Jababeka, Bekasi, Jawa Barat 17530 Indonesia

Tel: 62-21-8938-4201 (or 4202)

sales@ikeuchi.id

<https://www.ikeuchi.id/>

IKEUCHI (SHANGHAI) CO., LTD.

Room C, 21F, Electrical & Mechanical Bldg.,
600 Hengfeng Road, Shanghai 200070, P.R.China

Tel: 86-21-6140-9731

mist@kirinoikeuchi.com

<http://www.kirinoikeuchi.com/>

Tianjin Branch Tel: 86-22-2320-1676

Shenzhen Branch Tel: 86-755-8525-2221

Wuhan Branch Tel: 86-27-8558-8299

IKEUCHI EUROPE B.V.

Merwedeweg 6, 3621 LR, Breukelen, The Netherlands

Tel: 31-20-820-2175

info@ikeuchi.eu

<https://www.ikeuchi.eu/>

SIAM IKEUCHI CO., LTD.

909 Ample Tower Bldg. 8FL., Unit 8/2, 8/3, Debaratana Road,
Bangna Nuea, Bangna, Bangkok 10260 Thailand

Tel: 66-2-348-3801 Fax: 66-2-348-3802

thai@ikeuchi.co.th

<https://www.ikeuchi.co.th/>

IKEUCHI TAIWAN CO., LTD.

11F-1, No.27, Sec.1, Chung Shan N. Road, Taipei 10441,
Taiwan, R.O.C.

Tel: 886-2-2511-6289 Fax: 886-2-2541-6392

sales@ikeuchi.com.tw

<http://www.ikeuchi.com.tw/>